

Exhibit 1

IN THE CLAIMS

Please amend claims 8, 14, 15, and 20 as follows.

1 – 7. (Cancelled).

8. (Currently Amended) A processor comprising:

a reorder buffer;

one or more reservation stations; ~~and~~

a load-store dependency predictor coupled to the one or more reservation stations,
the load-store dependency predictor comprising:

a table with entries, wherein each entry comprises:

a load identifier[[]], a store identifier[[]], a reorder buffer entry
number[[]], a strength of prediction indicator[[]], and an
armed bit used to indicate that a store operation having an
identifier matching a store identifier of the respective entry
has been dispatched;

and

circuitry configured to: [[]]

set an armed bit for an entry in the table, responsive to detecting dispatch
of a store operation having an identifier that matches a store
identifier stored in that entry of the table;

in response to detecting that a given load operation has an identifier that
matches a load identifier of a given entry that has an armed bit that
is set:

predict the given load operation is dependent on a given store
operation having an identifier that matches a store identifier
of the given entry;

increment a strength of prediction indicator of the given entry
responsive to determining data for the given load operation
is retrieved from a first location, the first location
comprising a store queue; and

decrement the strength of prediction indicator of the given entry responsive to determining the data for the given_load operation is retrieved from a second location that is different from the first location, wherein the second location is a cache.

9. (Previously Presented) The processor as recited in claim 8, wherein the strength of prediction indicator of each entry of the table comprises a strength of prediction counter.
10. (Cancelled).
11. (Previously Presented) The processor as recited in claim 9, wherein the circuitry of the load-store dependency predictor is further configured to:
 - set the armed bit of the given entry, responsive to detecting the given store operation has an identifier that matches the store identifier of the given entry and determining a strength of prediction counter of the given entry is above a threshold; and
 - store a reorder buffer entry number of the given store operation in the given entry.
12. (Previously Presented) The processor as recited in claim 11, wherein a reservation station of the one or more reservation stations stores the given load operation with an identification of the reorder buffer entry number of the given entry.
13. (Previously Presented) The processor as recited in claim 12, wherein responsive to issuance of the given store operation:
 - the reorder buffer number of the given store operation is broadcast;
 - the broadcast reorder buffer number is detected by the reservation station storing the given load operation; and
 - the given load operation is permitted to issue responsive to detecting the broadcast reorder buffer number of the given store operation matches the

identification of the reorder buffer entry number stored with the given load operation.

14. (Currently Amended) The processor as recited in claim 9, wherein each entry of the table further comprises an age-out counter that is the counter of each entry of the table is decremented responsive to expiration of a programmable period of time.

15. (Currently Amended) A method comprising:

maintaining a table with entries, wherein each entry comprises:

a load identifier[[]], a store identifier[[]], a reorder buffer entry number[[]], a strength of prediction indicator[[]], and an armed bit used to indicate that a store operation having an identifier matching a store identifier of the respective entry has been dispatched;

setting an armed bit for an entry in the table, responsive to detecting dispatch of a store operation having an identifier that matches a store identifier stored in that entry of the table;

in response to detecting that a given load operation has an identifier that matches a load identifier of a given entry that has an armed bit that is set, predicting the given load operation is dependent on a given store operation having an identifier that matches a store identifier of the given entry;

incrementing a strength of prediction indicator of the given entry responsive to determining data for the given load operation is retrieved from a first location, the first location comprising a store queue; and

decrementing the strength of prediction indicator of the given entry responsive to determining the data for the given load operation is retrieved from a second location that is different from the first location, wherein the second location is a cache.

16. (Previously Presented) The method as recited in claim 15, further comprising:

dispatching the given load operation that has a particular identifier;

searching the table for a load identifier that matches the particular identifier; and

- responsive to finding a single entry that has a load identifier that matches the particular identifier and an armed bit that is set, establishing a dependency between the given load operation and a store operation corresponding to a reorder buffer entry number of the single entry.
17. (Previously Presented) The method as recited in claim 15, further comprising:
dispatching the given load operation that has a particular identifier;
searching the table for a load identifier that matches the particular identifier; and
responsive to finding multiple matching entries, each matching entry having a load identifier that matches the particular identifier and an armed bit that is set, establishing a dependency between the given load operation and multiple store operations.
18. (Previously Presented) The method as recited in claim 16, further comprising:
storing the given load operation in a reservation station with an identification of the reorder buffer entry number of the single entry;
broadcasting the reorder buffer entry number of the single entry responsive to issuance of the store operation corresponding to the reorder buffer entry number of the single entry; and
permitting the given load operation to issue from the reservation station responsive to detecting the broadcast reorder buffer number entry.
19. (Previously Presented) The method as recited in claim 17, further comprising
identifying an oldest store operation in each reservation station of a plurality of reservation stations responsive to establishing the dependency; and
permitting the given load operation to issue from a reservation station of the plurality of reservation stations responsive to issuance of all identified oldest store operations from respective reservation stations of the plurality of reservation stations.
20. (Currently Amended) The method as recited in claim 15, wherein ~~said strength of prediction indicator of~~ each entry of the table comprises ~~[[a]]~~ an age-out counter;

~~wherein the counter of each entry of the table~~ that is decremented responsive to expiration of a programmable period of time.

21. (Previously Presented) The processor as recited in claim 8, wherein responsive to detecting issuance of a given store operation from a reservation station, the circuitry is configured to clear an armed bit in the table that was previously set responsive to dispatch of the given store operation.
22. (Previously Presented) The method as recited in claim 17, further comprising permitting the given load operation to issue from a reservation station responsive to issuance of all store operations older than the given load operation.

REMARKS

Claims 8-9 and 11-22 are pending in the application. Claims 8, 14, 15, and 20 have been amended. Claims 8-9 and 11-22 accordingly remain pending in the application.

Examiner Interviews

Interviews were conducted between Examiner Mehta and the below signed representative on June 30, 2015 and July 1, 2015. Applicant would like to thank the Examiner for taking time to discuss the application. Provided herein are amendments Examiner Mehta indicated would lead to allowance of the present application. In order to expedite allowance, Applicant has provided the requested amendments which address formal matters and provide selected clarifications.

In light of the foregoing amendments and remarks, Applicant submits that all pending claims are now in condition for allowance, and an early notice to that effect is earnestly solicited. If a telephone interview would speed allowance of any pending claims, such is requested at the Examiner's convenience.

CONCLUSION

Applicant submits the application is in condition for allowance, and an early notice to that effect is requested.

If any extension of time (under 37 C.F.R. § 1.136) is necessary to prevent the above referenced application from becoming abandoned, Applicant hereby petitions for such an extension. If any fees are due, the Commissioner is authorized to charge said fees to Meyertons, Hood, Kivlin, Kowert, & Goetzel, P.C. Deposit Account No. 501505/5888-48100/RDR.

Respectfully submitted,

/Rory D. Rankin/

Rory D. Rankin

Reg. No. 47,884

ATTORNEY FOR APPLICANT(S)

Meyertons, Hood, Kivlin,
Kowert, & Goetzel, P.C.
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Phone: (512) 853-8800

Date: July 1, 2015

Application Serial No. 13/464,647 – Filed May 4, 2012

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.: 13/464,647

Filed: May 4, 2012

First Named

Inventor:

Stephan G. Meier

Title: LOAD-STORE
DEPENDENCY
PREDICTOR CONTENT
MANAGEMENT

Examiner: Mehta, Jyoti
Group/Art Unit: 2183
Conf. No: 8676
Atty. Dkt. No: 5888-48100 /
P12557US1

*****CERTIFICATE OF E-FILEING TRANSMISSION*****
I hereby certify that this correspondence is being
transmitted via electronic filing to the United States
Patent and Trademark Office on the date shown below

Rory D. Rankin

Printed Name _____

/Rory D. Rankin/
Signature

July 1, 2015
Date

SUPPLEMENTAL AMENDMENT

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Please amend the case as listed below.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
 United States Patent and Trademark Office
 Address: COMMISSIONER FOR PATENTS
 P.O. Box 1450
 Alexandria, Virginia 22313-1450
 www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

81310 7590 07/24/2015
 Meyertons, Hood, Kivlin, Kowert & G (Apple)
 P.O. BOX 398
 Austin, TX 78767-0398

EXAMINER

MEHTA, JYOTI

ART UNIT

PAPER NUMBER

2183

DATE MAILED: 07/24/2015

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/464,647	05/04/2012	Stephan G. Meier	5888-48100 / P12557US1	8676

TITLE OF INVENTION: LOAD-STORE DEPENDENCY PREDICTOR CONTENT MANAGEMENT

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$960	\$0	\$0	\$960	10/26/2015

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

Complete and send this form, together with applicable fee(s), to: **Mail** **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

81310 7590 07/24/2015
Meyertons, Hood, Kivlin, Kowert & G (Apple)
P.O. BOX 398
Austin, TX 78767-0398

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/464,647	05/04/2012	Stephan G. Meier	5888-48100 / P12557US1	8676

TITLE OF INVENTION: LOAD-STORE DEPENDENCY PREDICTOR CONTENT MANAGEMENT

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$960	\$0	\$0	\$960	10/26/2015

EXAMINER	ART UNIT	CLASS-SUBCLASS
MEHTA, JYOTI	2183	712-216000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) The names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☐ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ Applicant certifying micro entity status. See 37 CFR 1.29
☐ Applicant asserting small entity status. See 37 CFR 1.27
☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/464,647	05/04/2012	Stephan G. Meier	5888-48100 / P12557US1	8676

81310	7590	07/24/2015
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Meyertons, Hood, Kivlin, Kowert & G (Apple)
 P.O. BOX 398
 Austin, TX 78767-0398

EXAMINER	
MEHTA, JYOTI	

ART UNIT	PAPER NUMBER
2183	

DATE MAILED: 07/24/2015

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
 (Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records management conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

<i>Examiner-Initiated Interview Summary</i>	Application No. 13/464,647	Applicant(s) MEIER ET AL.	
	Examiner JYOTI MEHTA	Art Unit 2183	

All participants (applicant, applicant's representative, PTO personnel):

(1) JYOTI MEHTA. (3) _____.

(2) RORY D. RANKIN. (4) _____.

Date of Interview: 30 June 2015.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☒ No.
If Yes, brief description: _____.

Issues Discussed ☐ 101 ☒ 112 ☐ 102 ☐ 103 ☐ Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: 8, 14 and 20.

Identification of prior art discussed: None.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

Discussed the 112(b) issue (Claim language is not clear whether the circuitry is part of the processor or of the load store dependency predictor) in claim 8.

Discussed the 112(a) issues in claims 14 and 20.

Examiner indicated that fixing these issues would place the application in condition for allowance.

Applicant agreed to file a supplemental amendment to fix these issues.

Applicant recordation instructions: It is not necessary for applicant to provide a separate record of the substance of interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/J. M./ Examiner, Art Unit 2183	
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Notice of Allowability	Application No. 13/464,647 Examiner JYOTI MEHTA	Applicant(s) MEIER ET AL. Art Unit 2183 AIA (First Inventor to File) Status No
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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 7/1/2015.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on ____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are 8, 9, 11-22. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a) ☐ All b) ☐ Some *c) ☐ None of the:

1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: ____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date ____.
Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. <input type="checkbox"/> Notice of References Cited (PTO-892) 2. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date <u>5/5/2015 (2 filed), 7/1/2015 (2 filed)</u> 3. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material 4. <input checked="" type="checkbox"/> Interview Summary (PTO-413), Paper No./Mail Date <u>20150708</u> .	5. <input checked="" type="checkbox"/> Examiner's Amendment/Comment 6. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance 7. <input type="checkbox"/> Other _____.
--	---

/J. M./ Examiner, Art Unit 2183	/ANDREW CALDWELL/ Supervisory Patent Examiner, Art Unit 2183
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Application/Control Number: 13/464,647
Art Unit: 2183

Page 2

Allowability Notice

1. Claims 8, 9, 11-22 have been considered.
2. Examiner notes entry of the following:
 - a. Amended specification, claims filed 5/6/2015
 - b. Applicant arguments/remarks made in an amendment filed 5/6/2015
 - c. IDS statements filed 5/5/2015 and 7/1/2015
3. The IDS statements are being considered.
4. The supplemental amendment filed 7/1/2015 is being entered.
5. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.
6. Authorization for this examiner's amendment was given in a telephone interview with Rory Rankin on 7/1/2015.

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In the claims:

In claim 8 at line 28, after the second occurrence of the word "the",
delete "given_load" and insert --given load--

In claim 15 at line 15, after the first occurrence of the word "the",
delete "given_load" and insert --given load--

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Allowable Subject Matter

7. Claims 8, 9 and 11-22 are allowed.

8. The following is an examiner's statement of reasons for allowance:

Independent claims 8 and 15 require a load store dependency predictor with a table with entries, wherein each table stores a load identifier, a store identifier, a reorder buffer entry number, a strength of prediction indicator, and an armed bit that indicates that a store operation having an identifier matching a store identifier of the respective entry has been dispatched; and in response to a load operation having an identifier matching a load identifier of a given entry with an armed bit set, predicting the given load operation to be dependent on a given store operation and incrementing the strength of prediction indicator of the entry when data is received from the store queue and decrement the strength of prediction indicator when data is retrieved from a cache. Keller combined with other prior arts of record teaches load store dependency prediction and the strength of prediction indicator changing based on whether data is in the store queue or cache. However, Keller teaches 2 tables, one to record the dependency between a load and a store and another to indicate whether a store has recently been dispatched. A load PC indexes into the first table to detect a dependency on a store and then the second table is used to check whether a store has been dispatched (R# of the store is detected). Keller teaches multiple hits in the 2nd table and the R# of the youngest of the dispatched stores is selected. The function of the 2nd table is comparable to the claimed armed bit. However, with multiple R#s in the second table corresponding to a single entry in the first table, it would not be obvious to one of

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ordinary skill in the art to combine the two tables into a single table with the armed bit, as required by the claim. One of ordinary skill would need to further modify the implementation taught by the combination to accommodate the multiple R#s per entry and the selection of the youngest R#.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JYOTI MEHTA whose telephone number is (571)270-3995. The examiner can normally be reached on Mon-Thurs 7:30-6 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Caldwell can be reached on (571) 272-3702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic

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Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. M./

Examiner, Art Unit 2183

/ANDREW CALDWELL/

Supervisory Patent Examiner, Art Unit 2183

Examiner-Initiated Interview Summary	Application No. 13/464,647	Applicant(s) MEIER ET AL.	
	Examiner JYOTI MEHTA	Art Unit 2183	

All participants (applicant, applicant's representative, PTO personnel):

(1) JYOTI MEHTA. (3) _____.

(2) RORY D. RANKIN. (4) _____.

Date of Interview: 30 June 2015.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☒ No.
If Yes, brief description: _____.

Issues Discussed ☐ 101 ☒ 112 ☐ 102 ☐ 103 ☐ Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: 8, 14 and 20.

Identification of prior art discussed: None.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

Discussed the 112(b) issue (Claim language is not clear whether the circuitry is part of the processor or of the load store dependency predictor) in claim 8.

Discussed the 112(a) issues in claims 14 and 20.

Examiner indicated that fixing these issues would place the application in condition for allowance.

Applicant agreed to file a supplemental amendment to fix these issues.

Applicant recordation instructions: It is not necessary for applicant to provide a separate record of the substance of interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/J. M./ Examiner, Art Unit 2183	
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